

IN THE CLAIMS

Please amend claims 1, 13, 20, 21, 22, 25, and 26 as follows.

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1. (Fifth Amendment) A method of forming diamond crystals or a diamond film comprising:
- disposing a substrate in a reaction chamber;
 - introducing, in the absence of a gas stream, a liquid precursor substantially free of water and containing methanol and at least one carbon and oxygen containing compound having a carbon to oxygen ratio greater than one into an inlet of the reaction chamber;
 - vaporizing the liquid precursor; and
 - subjecting the vaporized precursor, in the absence of a carrier gas, to a plasma under conditions effective to disassociate the vaporized precursor and promote diamond growth on the substrate in a pressure range from about 20 to 80 Torr.
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13. (Fourth Amendment) A plasma enhanced chemical vapor deposition of diamond crystals and diamond films on surfaces of a substrate, comprising:
- providing an apparatus including an inlet, a disassociation zone, a deposition zone and an outlet;
 - introducing, in the absence of a gas stream, a liquid precursor substantially free of water and comprising methanol and at least one carbon and oxygen containing compound having a carbon to oxygen ratio greater than one, into the inlet under conditions effective to vaporize the liquid precursor, flow the vaporized precursor through the disassociation zone, and through the outlet;
 - disassociating and reacting the vaporized precursor as vaporized precursor flows or diffuses through the disassociation zone to produce OH, H, O, and carbon containing radicals; and
 - producing diamond crystals or diamond films on the surface of the substrate in the absence of a carrier gas and in a pressure range from about 20 to 80 Torr.
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21. (First Amendment) A method of forming diamond crystals or a diamond film comprising:

disposing a substrate in a reaction chamber in a non-magnetic microwave field plasma system;

introducing a liquid precursor containing methanol and at least one carbon and oxygen containing compound having a carbon to oxygen ratio greater than one into an inlet of the reaction chamber;

vaporizing the liquid precursor;

subjecting the vaporized precursor to a plasma under conditions effective to disassociate the vaporized precursor; and

promoting diamond growth on the substrate, in the absence of a carrier gas, at a pressure in the range from about 20 to 80 Torr.

22. (First Amendment) The method of claim 21, wherein promoting diamond growth includes:

promoting diamond growth at a rate between about 1 and 2 micrometers per hour, wherein the pressure is in the range of about 60 to 80 Torr, a substrate temperature is in the range of about 1000°C and 1030°C, and a microwave power is about 2kW.

25. (First Amendment) A plasma enhanced chemical vapor deposition of diamond crystals and diamond films on surfaces of a substrate, comprising:

providing a non-magnetic microwave field plasma apparatus including an inlet, a disassociation zone, a deposition zone and an outlet;

introducing a liquid precursor comprising methanol and at least one carbon and oxygen containing compound having a carbon to oxygen ratio greater than one, into the inlet under conditions effective to vaporize the liquid precursor, flow the vaporized precursor through the disassociation zone, and through the outlet;

disassociating and reacting the vaporized precursor as vaporized precursor flows or diffuses through the disassociation zone to produce OH, H, O, and carbon containing radicals; and

producing diamond crystals or diamond films on the surface of the substrate in the absence of a carrier gas at a pressure in the range from about 20 to 80 Torr.

26. (First Amendment) The method of claim 25, wherein promoting diamond growth includes:

promoting diamond growth at a rate between about 1 and 2 micrometers per hour, wherein the pressure is in the range of about 60 to 80 Torr, a substrate temperature is in the range of about 1000°C and 1030°C, and a microwave power is about 2kW.

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Please add the following new claims.

29. (Newly Added) The method of claim 21, wherein promoting diamond growth includes:
- promoting diamond growth at a rate between about 2.1 and 2.7 micrometers per hour, wherein the pressure is in the range of about 30 to 36 Torr, a substrate temperature is in the range of about 720°C and 800°C, and a microwave power is about 1kW.
30. (Newly Added) The method of claim 25, wherein promoting diamond growth includes:
- promoting diamond growth at a rate between about 2.1 and 2.7 micrometers per hour, wherein the pressure is in the range of about 30 to 36 Torr, a substrate temperature is in the range of about 720°C and 800°C, and a microwave power is about 1kW.
31. (Newly Added) A method of forming diamond crystals or a diamond film comprising:
- disposing a substrate in a reaction chamber in a non-magnetic microwave field plasma system;
- introducing a liquid precursor containing methanol and at least one carbon and oxygen containing compound having a carbon to oxygen ratio greater than one into an inlet of the reaction chamber;
- vaporizing the liquid precursor;
- subjecting the vaporized precursor to a plasma under conditions effective to disassociate the vaporized precursor, wherein the conditions in the non-magnetic field plasma system include having a microwave power in the range from about 0.9 kW to 2kW and a substrate temperature in the range between about 750°C and 1030°C; and
- promoting diamond growth on the substrate at a rate between about 1 and 2.7 micrometers per hour in a pressure range from about 20 to 80 Torr.
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